

## **Commercial Applications of Telemedicine**

Thomas A. Natiello, Ph.D.  
President, Telemedicine Systems Corporation  
Miami, Florida

Telemedicine Systems Corporation was established in 1976 and is a private commercial supplier of telemedicine systems. These systems are various combinations of communications and diagnostic technology, designed to allow the delivery of health care services to remote facilities. The technology and the health care services are paid for by the remote facilities, such as prisons.

### **THE COMMERCIAL DELIVERY OF REMOTE HEALTH CARE**

Bridging distances between the sources of health care and the users of this care is becoming more common through the use of technology. However, for this technology to become widely used it is important that it be paid for in the context of the services that it delivers.

Telemedicine systems provide technology for the delivery of health care that allows prisons to purchase quality health care services and to save in security and transportation costs. This makes the use of the technology economically feasible.

The success of telemedicine in the private sector will depend on the comparative pricing and added value advantages of delivering health care services using communications technology.

### **EXAMPLES OF ECONOMIC AND VALUE ADDED THEORIES AFFECTING THE SUCCESSFUL COMMERCIAL APPLICATION OF TELEMEDICINE**

The following are observations of factors which must be considered for a successful communication system and are based on experience in the successful commercial operation of a telemedicine system over the last 5 years.

In all situations the objective is to maximize the use of resources at the remote site, to provide the highest quality of care possible and to minimize the need for additional resources or the transportation of the patient or the consultant.

— If information can be gathered and communicated, a diagnosis can be made.

If substantive test results can be supplied at the time of consultation, the specialist need only interpret the results to make a diagnosis. If, however, further tests are required or the results are inconclusive, the patient must be referred outside if the necessary equipment to perform tests is

not available at that site. Therefore, if the appropriate information is available, the job can be done completely utilizing the telemedicine system.

In cases where information or capabilities are not, or are, available in a remote location, alternative modalities of care can be selected. For example, in one case the physician at a remote site recommended that a patient be referred outside for arthroscopy of a painful right knee. The specialist instead recommended the use of anti-inflammatory agents, which is a different modality of care utilizing the resources available at the remote site and removed the need for outside referral. In this type of instance, physical therapy was also recommended in place of outside referral for surgical procedures. In either situation value is added to the remote site.

In the instance of prescription of medication, the specialist can often determine an adjustment in dosage according to the symptoms presented over the system. This is especially evident in fields such as dermatology, which has a referral rate as low as 0 percent. The specialist can view the patient, discuss the symptoms, and adjust medication.

This means that the physician over the telemedicine system is able to not only diagnose the condition of the patient, but also to evaluate the resources at the remote site and make recommendations based upon those resources.

— The physician must be able to assess the needs of the patient and also the resources on hand, determine an alternative combination of the resources on hand, or refer to a place that has more extensive resources. In any case the value added must be equal to the cost of the services provided and the cost of the communications technology.

For example, the use of the Telemedicine System results in reduction of unnecessary referrals caused by an exaggerated analysis of the situation by the physician or patient on site, which is better interpreted by the physician off site. This results in a reversal in the referral pattern, which is normally associated with the use of specialists. In this application, the referral pattern is a reduction in the amount of referrals.

— The use of the telemedicine system results in a more effective utilization of existing information and service resources.

The specialists' consultation does not necessarily require referral, but often results in more information being derived from the same data, resulting in a maximization of the utilization of existing resources and thereby opening up alternative modalities of care and allowing the consideration of their associated costs, and the utilization of existing resources.

— Multiple specialists from the same source allow immediate diagnosis of interactive treatment, reducing negative outcomes and associated costs.

— The efficacy of the system is enhanced when of all patients seen over telemedicine, only those patients actually in need of physical contact are referred.

— The type of provider and type of care that is feasible over the telemedicine system are directly related to categories of care that can be billed and are allowable under existing payment plans.

Commercial applications require economic feasibility, derived from a source of payment. For example, in the United States today, the primary source of payment is through insurance companies, government agencies and programs, managed care groups, and fee for service.

For example, remote and on site professional levels must relate to available payment schedules, the most common of which at this time would be payment to specialist consultants or primary care consultants, or the consultant level associated with allowable charges to the payer that exist in the given situation.

— The type of payment agreement and type of payer determines the telemedicine systems services that are economically feasible.

— Services that can be sold to actual consumers or brokers offer the best opportunity for innovative commercial opportunities.

#### ECONOMIC EFFECTIVENESS OF TELEMEDICINE SYSTEM CONSULTS BY SPECIALTY: THE BOTTOM LINE

After identification of the reasons for referral from a remote site for each specialty, it is possible to identify those specialties that can best utilize telemedicine. The following considers each specialty from statistical information obtained from the use of the telemedicine system.

Neurology: There was a 15 percent outside referral rate within the specialty of neurology, outside referrals for diagnostic imaging.

Cardiology: This specialty had a 32 percent outside referral rate, for noninvasive and invasive diagnostic testing, and surgery.

Urology: A 26 percent outside referral rate for IVP, nephrogram, ultrasound, removal of kidney stones, cystogram, transurethral biopsy of prostate.

Endocrinology: A 10 percent referral rate for diagnostic testing.

Nephrology: No outside referrals.

Dermatology: No outside referrals.

General Surgery: A 36 percent outside referral rate for surgery, the most common being hernia repair.

Orthopedic: A 27 percent referral rate. The most common procedure performed was arthroscopy, followed by fracture reduction.

## SUCCESSFUL COMMERCIAL APPLICATIONS

Successful commercial applications of telemedicine will require an understanding of the factors discussed here today. Most important is the need to clearly demonstrate to the buyer that there is in fact a value added benefit to the use of communications technology for the delivery of quality health services to remote locations. The total value added must equal or exceed communications and technology costs.